

IN THE CLAIMS

The current claims follow. For claims not marked as amended in this response, any difference in the claims below and the previous state of the claims is unintentional and in the nature of a typographical error.

1. (Previously Presented) For use in a digital data communications system, an apparatus for use as a channel encoder comprising:
 - a first Turbo encoder capable of Turbo encoding data;
 - an interleaver unit coupled to said first Turbo encoder, said interleaver unit capable of interleaving Turbo encoded data from said first Turbo encoder; and
 - a second Turbo encoder coupled to said interleaver unit, said second Turbo encoder capable of Turbo encoding interleaved data from said interleaver unit.
2. (Original) The apparatus as set forth in Claim 1 further comprising a symbol puncture and repetition unit coupled to said second Turbo encoder, said symbol puncture and repetition unit capable of puncturing and repeating Turbo encoded data from said second Turbo encoder.
3. (Original) The apparatus as set forth in Claim 2 wherein said apparatus is capable of providing a packet data error rate less than one percent (1%) when 64-QAM RF modulation is used.

4. (Original) The apparatus as set forth in Claim 1 wherein said first Turbo encoder comprises:

a first convolutional encoder capable of convolutionally encoding data;

an interleaver unit coupled to said first convolutional encoder, said interleaver unit capable of interleaving convolutionally encoded data from said first convolutional encoder; and

a second convolutional encoder coupled to said interleaver unit, said second convolutional encoder capable of convolutionally encoding interleaved data from said interleaver unit.

5. (Original) The apparatus as set forth in Claim 1 wherein said second Turbo encoder comprises:

a first convolutional encoder capable of convolutionally encoding data;

an interleaver unit coupled to said first convolutional encoder, said interleaver unit capable of interleaving convolutionally encoded data from said first convolutional encoder; and

a second convolutional encoder coupled to said interleaver unit, said second convolutional encoder capable of convolutionally encoding interleaved data from said interleaver unit.

6. (Previously Presented) For use in a digital data communications system, an apparatus for use as a channel encoder comprising:

a first Turbo encoder capable of Turbo encoding data, wherein said first Turbo encoder is capable of receiving data from a source encoder of said digital data communications system;

an interleaver unit coupled in parallel with said first Turbo encoder, wherein said interleaver unit is capable of receiving data from said source encoder of said digital data communications system, and wherein said interleaver unit is capable of interleaving said data from said source encoder;

a second Turbo encoder capable of Turbo encoding data, wherein an input of said second Turbo encoder is coupled to an output of said interleaver unit, and wherein said second Turbo encoder is capable of Turbo encoding interleaved data from said interleaver unit; and

a multiplexer having a first input coupled to an output of said first Turbo encoder and having a second input coupled to an output of said second Turbo encoder, said multiplexer capable of multiplexing data from said first Turbo encoder and from said second Turbo encoder.

7. (Original) The apparatus as set forth in Claim 6 further comprising a symbol puncture and repetition unit having an input coupled to an output of said multiplexer, said symbol puncture and repetition unit capable of puncturing and repeating multiplexed data from said multiplexer.

8. (Original) The apparatus as set forth in Claim 6 wherein said first Turbo encoder comprises:

a first convolutional encoder capable of convolutionally encoding data;

an interleaver unit coupled to said first convolutional encoder, said interleaver unit capable of interleaving convolutionally encoded data from said first convolutional encoder; and

a second convolutional encoder coupled to said interleaver unit, said second convolutional encoder capable of convolutionally encoding interleaved data from said interleaver unit.

9. (Original) The apparatus as set forth in Claim 6 wherein said second Turbo encoder comprises:

a first convolutional encoder capable of convolutionally encoding data;

an interleaver unit coupled to said first convolutional encoder, said interleaver unit capable of interleaving convolutionally encoded data from said first convolutional encoder; and

a second convolutional encoder coupled to said interleaver unit, said second convolutional encoder capable of convolutionally encoding interleaved data from said interleaver unit.

10. (Original) A digital data communications system comprising a channel encoder comprising:

a first Turbo encoder capable of Turbo encoding data from a source encoder of said digital data communications system;

an interleaver unit coupled to said first Turbo encoder, said interleaver unit capable of interleaving Turbo encoded data from said first Turbo encoder; and

a second Turbo encoder coupled to said interleaver unit, said second Turbo encoder capable of Turbo encoding interleaved data from said interleaver unit.

11. (Original) The digital data communications system as set forth in Claim 10 wherein said channel encoder further comprises a symbol puncture and repetition unit coupled to said second Turbo encoder, said symbol puncture and repetition unit capable of puncturing and repeating Turbo encoded data from said second Turbo encoder.

12. (Original) The digital data communications system as set forth in Claim 10 wherein said first Turbo encoder comprises:

- a first convolutional encoder capable of convolutionally encoding data;
- an interleaver unit coupled to said first convolutional encoder, said interleaver unit capable of interleaving convolutionally encoded data from said first convolutional encoder; and
- a second convolutional encoder coupled to said interleaver unit, said second convolutional encoder capable of convolutionally encoding interleaved data from said interleaver unit.

13. (Original) The digital data communications system as set forth in Claim 10 wherein said second Turbo encoder comprises:

- a first convolutional encoder capable of convolutionally encoding data;
- an interleaver unit coupled to said first convolutional encoder, said interleaver unit capable of interleaving convolutionally encoded data from said first convolutional encoder; and
- a second convolutional encoder coupled to said interleaver unit, said second convolutional encoder capable of convolutionally encoding interleaved data from said interleaver unit.

14. (Previously Presented) A digital data communications system comprising a channel encoder comprising:

a first Turbo encoder capable of Turbo encoding data, wherein said first Turbo encoder is capable of receiving data from a source encoder of said digital data communications system;

an interleaver unit coupled in parallel with said first Turbo encoder, wherein said interleaver unit is capable of receiving data from said source encoder of said digital data communications system, and wherein said interleaver unit is capable of interleaving said data from said source encoder;

a second Turbo encoder capable of Turbo encoding data, wherein an input of said second Turbo encoder is coupled to an output of said interleaver unit, and wherein said second Turbo encoder is capable of Turbo encoding interleaved data from said interleaver unit; and

a multiplexer having a first input coupled to an output of said first Turbo encoder and having a second input coupled to an output of said second Turbo encoder, said multiplexer capable of multiplexing data from said first Turbo encoder and from said second Turbo encoder.

15. (Original) The digital data communications system as set forth in Claim 14 wherein said channel encoder further comprises a symbol puncture and repetition unit having an input coupled to an output of said multiplexer, said symbol puncture and repetition unit capable of puncturing and repeating multiplexed data from said multiplexer.

16. (Original) The digital data communications system as set forth in Claim 14 wherein said first Turbo encoder comprises:

- a first convolutional encoder capable of convolutionally encoding data;
- an interleaver unit coupled to said first convolutional encoder, said interleaver unit capable of interleaving convolutionally encoded data from said first convolutional encoder; and
- a second convolutional encoder coupled to said interleaver unit, said second convolutional encoder capable of convolutionally encoding interleaved data from said interleaver unit.

17. (Original) The digital data communications system as set forth in Claim 14 wherein said second Turbo encoder comprises:

- a first convolutional encoder capable of convolutionally encoding data;
- an interleaver unit coupled to said first convolutional encoder, said interleaver unit capable of interleaving convolutionally encoded data from said first convolutional encoder; and
- a second convolutional encoder coupled to said interleaver unit, said second convolutional encoder capable of convolutionally encoding interleaved data from said interleaver unit.

18. (Previously Presented) For use in a digital data communications system comprising a channel encoder, a method of operating said channel encoder comprising the steps of:

- encoding data with a first Turbo encoder;

interleaving Turbo encoded data from said first Turbo encoder with a first interleaver unit;
and
encoding interleaved data from said first interleaver unit with a second Turbo encoder.

19. (Original) The method as set forth in Claim 18 further comprising the step of:
puncturing and repeating Turbo encoded data from said second Turbo encoder in a symbol
puncture and repetition unit coupled to said second Turbo encoder.

20. (Original) The method as set forth in Claim 18 wherein said step of encoding data
with a first Turbo encoder comprises the steps of:
convolutionally encoding data in a first convolutional encoder;
interleaving convolutionally encoded data from said first convolutional encoder in a second
interleaver unit coupled to said first convolutional encoder; and
convolutionally encoding interleaved data from said second interleaver unit in a second
convolutional encoder coupled to said second interleaver unit.

21. (Original) The method as set forth in Claim 18 wherein said step of encoding
interleaved data from said first interleaver unit with a second Turbo encoder comprises the steps of:
convolutionally encoding interleaved data from said first interleaver unit in a first
convolutional encoder;

interleaving convolutionally encoded data from said first convolutional encoder in a second interleaver unit coupled to said first convolutional encoder; and

convolutionally encoding interleaved data from said second interleaver unit in a second convolutional encoder coupled to said second interleaver unit.

22. (Original) For use in a digital data communications system comprising a channel encoder, a method of operating said channel encoder, said method comprising the steps of:

encoding data from a source encoder of said digital data communications system with a first Turbo encoder;

interleaving data from a source encoder of said digital data communications system with a first interleaver unit coupled in parallel with said first Turbo encoder;

encoding interleaved data from said first interleaver unit with a second Turbo encoder coupled to said first interleaver unit; and

multiplexing interleaved data from said first interleaver unit and Turbo encoded data from said first Turbo encoder in a multiplexer coupled to said first interleaver unit and to said first Turbo encoder.

23. (Original) The method as set forth in Claim 22 further comprising the step of:
puncturing and repeating multiplexed data from said multiplexer in a symbol puncture and repetition unit coupled to said multiplexer.

24. (Original) The method as set forth in Claim 22 wherein said step of encoding data from a source encoder of said digital data communications system with a first Turbo encoder comprises the steps of:

convolutionally encoding said data from said source encoder in a first convolutional encoder;
interleaving convolutionally encoded data from said first convolutional encoder in a second interleaver unit coupled to said first convolutional encoder; and
convolutionally encoding interleaved data from said second interleaver unit in a second convolutional encoder coupled to said second interleaver unit.

25. (Original) The method as set forth in Claim 22 wherein said step of encoding interleaved data from said first interleaver unit with a second Turbo encoder comprises the steps of:

convolutionally encoding interleaved data from said first interleaver unit in a first convolutional encoder;
interleaving convolutionally encoded data from said first convolutional encoder in a second interleaver unit coupled to said first convolutional encoder; and
convolutionally encoding interleaved data from said second interleaver unit in a second convolutional encoder coupled to said second interleaver unit.